General Term.

$(x+y)^n = {}^nC_0 x^n y^0 + {}^nC_1 x^{n-1} y^1 + {}^nC_2 x^{n-2} y^2 + ... + {}^nC_r x^{n-r} y^r + ... + {}^nC_n x^0 y^n$

The first term = ${}^nC_0 x^n y^0$

The second term = ${}^nC_1 x^{n-1} y^1$. The third term = ${}^nC_2 x^{n-2} y^2$ and so on

The term ${}^nC_r x^{n-r} y^r$ is the $(r+1)^{th}$ term from beginning in the expansion of $(x+y)^n$.

Let T_{r+1} denote the (r + 1)th term $\therefore T_{r+1} = {}^nC_r x^{n-r} y^r$

This is called general term, because by giving different values to r, we can determine all terms of the expansion.

In the binomial expansion of $(x-y)^n, T_{r+1} = (-1)^r \, {}^nC_r x^{n-r} y^r$

In the binomial expansion of $(1+x)^n, T_{r+1} = {}^nC_r x^r$

In the binomial expansion of $(1-x)^n, T_{r+1} = (-1)^r \, {}^nC_r x^r$

Note: In the binomial expansion of $(x+y)^n$, the pth term from the end is $(n-p+2)^{th}$ term from beginning.

Important Tips

- In the expansion of $(x+y)^n, n \in N$

$$\frac{T_{r+1}}{T_r} = \left(\frac{n-r+1}{r}\right)\frac{y}{x}$$

- The coefficient of x^{n-1} in the expansion of $(x-1)(x-2).......(x-n) = -\frac{n(n+1)}{2}$
- The coefficient of x^{n-1} in the expansion of $(x+1)(x+2).....(x+n) = \frac{n(n+1)}{2}$